Physics

College of Natural Science and Mathematics
Department of Physics
907-474-7339
www.uaf.edu/physics/

B.A., B.S. Degrees

Minimum Requirements for Degrees: 120 credits

The science of physics is concerned with the nature of matter and energy in all physical systems, from elementary particles to the structure and origin of the universe. Physics, together with mathematics and chemistry, provides the foundation for work in all fields of the physical sciences and engineering, and contributes greatly to other disciplines such as the biosciences and medicine.

The undergraduate curriculum provides a solid foundation in classical and modern physics, with emphasis on both its experimental and theoretical aspects. A student completing this curriculum can be well prepared for advanced study in physics and related sciences, and for other careers that also require refined abilities in problem solving.

The physics department is also responsible for the bachelor's degree programs in general science and applied physics. These programs are also described in this catalog.

Major — B.A. Degree

1. Complete the following:
   - PHYS F211X—General Physics .............................................4
   - PHYS F212X—General Physics .............................................4
   - PHYS F213X—General Modern Physics .................................4
   - PHYS F301—Introduction to Mathematical Physics .................4
   - PHYS approved electives ...................................................20

   ** Student must earn a C grade or better in each course.

   *** Satisfies core curriculum or B.A. degree requirements, but not both.

2. Complete the following:
   - MATH F200X—Calculus I Not required .................................4
   - MATH F201X—Calculus II Not required ...............................4
   - MATH F202X—Calculus III ...............................................4
   - MATH electives at the F300-level or above .........................3

3. Minimum credits required .....................................................120

B.A., B.S. Degrees

1. Complete the general university requirements (pages 131–136).
2. Complete the general degree requirements (page 135).
3. Complete the following program (major) requirements:
   a. Complete the following:
      - PHYS F211X—General Physics .............................................4
      - PHYS F212X—General Physics .............................................4
      - PHYS F213X—General Modern Physics .................................4
      - PHYS F301—Introduction to Mathematical Physics .................4
      - PHYS approved electives ...................................................20

   ** Student must earn a C grade or better in each course.

   *** Satisfies core curriculum or B.A. degree requirements, but not both.

b. Complete the following:
   - MATH F200X—Calculus I Not required .................................4
   - MATH F201X—Calculus II Not required ...............................4
   - MATH F202X—Calculus III ...............................................4
   - MATH electives at the F300-level or above .........................3

4. Minimum credits required .....................................................120

   ** Student must earn a C grade or better in each course.

   *** Satisfies core curriculum or B.A. degree requirements, but not both.

Major — B.S. Degree

1. Complete the following:
   - PHYS F211X—General Physics .............................................4
   - PHYS F212X—General Physics .............................................4
   - PHYS F213X—General Modern Physics .................................4
   - PHYS F220—Introduction to Computational Physics ...............4
   - PHYS F301—Introduction to Mathematical Physics .................4
   - PHYS approved electives ...................................................16
   - MATH electives .................................................................3

2. Complete the following:
   - MATH F200X—Calculus I Not required .................................4
   - MATH F201X—Calculus II Not required ...............................4
   - MATH F202X—Calculus III ...............................................4
   - MATH electives at the F300-level or above .........................3

3. Minimum credits required .....................................................120

Requirements for physics teachers (grades 7 – 12)

1. Complete all the requirements of the B.A. or B.S. degree.
2. All prospective physics teachers must complete the following:
   - CHEM F105X and CHEM F106X; GEOS F101X; BIOL F115X (8)

3. All prospective science teachers must complete the following:
   - MATH F314, F421 and F422

Minor

1. Complete the following:
   - PHYS F103X – F104X—College Physics (8)
   - or PHYS F211X – F212X—General Physics (8) .......................8

2. Complete the following:
   - PHYS F213X—Elementary Modern Physics ............................4

3. Minimum credits required .....................................................20
All degrees (e.g. B.A., B.S., etc.) require additional courses. Refer to specific degree and program requirements.

Baccalaureate Core Requirements

COMMUNICATION (9)
Complete the following:
ENGL F111X .................................................(3) ___
   ENGL F190H may be substituted.
Complete one of the following:
ENGL F211X OR ENGL F213X .........................(3) ___
Complete one of the following:
COMM F131X OR COMM F141X ......................(3) ___

PERSPECTIVES ON THE HUMAN CONDITION (18)
Complete all of the following four courses:
ANTH F100X/SOC F100X ................................(3) ___
ECON F100X OR PS F100X ...............................(3) ___
HIST F100X..................................................(3) ___
ENGL/FL F200X ..............................................(3) ___
Complete one of the following three courses:
ART/MUS/THR F200X, HUM F201X OR ANS F202X..(3) ___
Complete one of the following six courses:
BA F323X, COMM F300X, JUST F300X, NRM F303X,
PS F300X OR PHIL F322X .................................(3) ___
OR complete 12 credits from the above courses PLUS
• two semester-length courses in a single Alaska Native language or
   other non-English language OR
• three semester-length courses (9 credits) in American Sign
   Language taken at the university level.

MATHEMATICS (3)
Complete one of the following:
MATH F103X, MATH F107X, MATH F161X OR
STAT F200X ...................................................(3 – 4) ___
   * No credit may be earned for more than one of MATH F107X or
     F161X.
OR complete one of the following:
MATH F200X, MATH F201X, MATH F202X,
MATH F262X OR MATH F272X ..............................(4) ___
   * Or any math course having one of these as a prerequisite.

NATURAL SCIENCES (8)
Complete any two (4-credit) courses:
ATM F101X ....................................................(4) ___
BIOL F100X ...................................................(4) ___
BIOL F103X ...................................................(4) ___
BIOL F104X ...................................................(4) ___
BIOL F111X ...................................................(4) ___
BIOL F112X ...................................................(4) ___
BIOL F115X ...................................................(4) ___
BIOL F116X ...................................................(4) ___
CHEM F100X ..................................................(4) ___
CHEM F103X ..................................................(4) ___
CHEM F104X ..................................................(4) ___
CHEM F105X ..................................................(4) ___
CHEM F106X ..................................................(4) ___
GEOG F111X ..................................................(4) ___
GEOS F100X ..................................................(4) ___
GEOS F101X ..................................................(4) ___
GEOS F112X ..................................................(4) ___
GEOS F120X ..................................................(4) ___
GEOS F125X ..................................................(4) ___
MSL F111X ....................................................(4) ___
PHYS F102X ..................................................(4) ___
PHYS F103X ..................................................(4) ___
PHYS F104X ..................................................(4) ___
PHYS F115X ..................................................(4) ___
PHYS F116X ..................................................(4) ___
PHYS F175X ..................................................(4) ___
PHYS F211X ..................................................(4) ___
PHYS F212X ..................................................(4) ___
PHYS F213X ..................................................(4) ___

LIBRARY AND INFORMATION RESEARCH (0 – 1)
Successful completion of library skills competency test OR
LS F100X or F101X prior to junior standing..............(0 – 1) ___

UPPER-DIVISION WRITING AND ORAL COMMUNICATION (0)
Complete the following:
Two writing intensive courses designated (W) ..............(0) ___
and one oral communication intensive course
designated (O) ..............................................(0) ___
   OR two oral communication intensive courses designated
     (O/2), at the upper-division level (see degree and/or major
     requirements)...........................................(0) ___

CORE CREDITS REQUIRED ................................38 – 39
Minimum credits required for degree .........................120